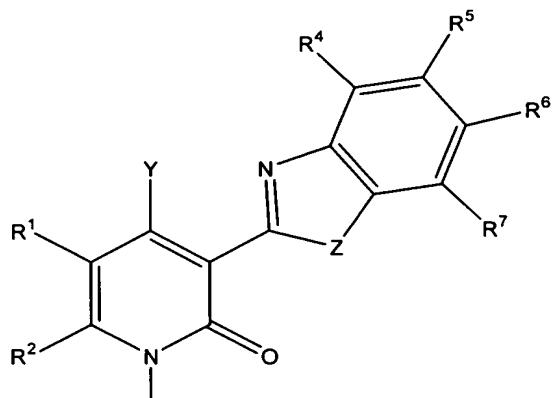


## CLAIMS

What is claimed is:

- 1               1. A compound having the structure I, a tautomer of the  
2 compound, a pharmaceutically acceptable salt of the compound, or a  
3 pharmaceutically acceptable salt of the tautomer



4

5               wherein,

6               Y is selected from the group consisting of -OH, -OR<sup>8</sup> groups,  
7               -SH, -SR<sup>9</sup> groups, -NR<sup>10</sup>R<sup>11</sup> groups, -CN, -C(=O)-R<sup>12</sup> groups,  
8               substituted and unsubstituted alkyl groups, substituted and  
9               unsubstituted alkenyl groups, substituted and unsubstituted  
10          alkynyl groups, substituted and unsubstituted aralkyl groups,  
11          substituted and unsubstituted heterocyclalkyl groups,  
12          substituted and unsubstituted alkylaminoalkyl groups,  
13          substituted and unsubstituted dialkylaminoalkyl groups,  
14          substituted and unsubstituted arylaminoalkyl groups, substituted and  
15          unsubstituted diarylaminoalkyl groups, substituted and  
16          unsubstituted (alkyl)(aryl)aminoalkyl groups, substituted and  
17          unsubstituted heterocyclaminoalkyl groups, substituted and  
18          unsubstituted diheterocyclaminoalkyl groups, substituted and

19           unsubstituted (alkyl)(heterocycll)aminoalkyl groups, substituted  
20           and unsubstituted (aryl)(heterocycll)aminoalkyl groups,  
21           substituted and unsubstituted heterocycll groups, substituted  
22           and unsubstituted aryl groups, substituted and unsubstituted  
23           hydroxyalkyl groups, substituted and unsubstituted alkoxyalkyl  
24           groups, substituted and unsubstituted aryloxyalkyl groups, and  
25           substituted and unsubstituted heterocyclyoxyalkyl groups;

26           Z is selected from the group consisting of O, S, and NR<sup>13</sup>  
27           groups;

28           R<sup>1</sup> and R<sup>2</sup> join to form a 6 membered substituted or  
29           unsubstituted ring comprising at least one O, N, or S atom;

30           R<sup>3</sup> and R<sup>13</sup> may be the same or different and are selected from  
31           the group consisting of H, -OH, substituted and unsubstituted  
32           alkoxy groups, substituted and unsubstituted alkyl groups,  
33           substituted and unsubstituted aryl groups, -C(=O)H, -C(=O)-alkyl  
34           groups, and -C(=O)-aryl groups;

35           R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> may be the same or different and are  
36           independently selected from the group consisting of H, Cl, Br, F,  
37           I, -NO<sub>2</sub>, -CN, -OH, -OR<sup>14</sup> groups, -NR<sup>15</sup>R<sup>16</sup> groups, -C(=O)R<sup>17</sup>  
38           groups, -SH, -SR<sup>18</sup> groups, -S(=O)R<sup>19</sup> groups, S(=O)<sub>2</sub>R<sup>20</sup>  
39           groups, substituted and unsubstituted amidinyl groups,  
40           substituted and unsubstituted guanidinyl groups, substituted and  
41           unsubstituted primary, secondary, and tertiary alkyl groups,  
42           substituted and unsubstituted aryl groups, substituted and  
43           unsubstituted alkenyl groups, substituted and unsubstituted  
44           alkynyl groups, substituted and unsubstituted heterocycll  
45           groups, substituted and unsubstituted alkylaminoalkyl groups,  
46           substituted and unsubstituted dialkylaminoalkyl groups,  
47           substituted and unsubstituted arylaminoalkyl groups, substituted

48 and unsubstituted diarylaminoalkyl groups, substituted and  
49 unsubstituted (alkyl)(aryl)aminoalkyl groups, substituted and  
50 unsubstituted heterocyclalkyl groups, substituted and  
51 unsubstituted aminoalkyl groups, substituted and unsubstituted  
52 heterocyclaminoalkyl groups, substituted and unsubstituted  
53 diheterocyclaminoalkyl groups, substituted and unsubstituted  
54 (alkyl)(heterocyclyl)aminoalkyl groups, substituted and  
55 unsubstituted (aryl)(heterocyclyl)aminoalkyl groups, substituted  
56 and unsubstituted hydroxyalkyl groups, substituted and  
57 unsubstituted alkoxyalkyl groups, substituted and unsubstituted  
58 aryloxyalkyl groups, and substituted and unsubstituted  
59 heterocyclyoxyalkyl groups;

60 R<sup>8</sup> is selected from the group consisting of substituted and  
61 unsubstituted alkyl groups, substituted and unsubstituted aryl  
62 groups, substituted and unsubstituted heterocycl groups,  
63 substituted and unsubstituted heterocyclalkyl groups, -C(=O)H,  
64 -C(=O)-alkyl groups, -C(=O)-aryl groups, -C(=O)O-alkyl groups,  
65 -C(=O)O-aryl groups, -C(=O)NH<sub>2</sub>, -C(=O)NH(alkyl) groups,  
66 -C(=O)NH(aryl) groups, -C(=O)N(alkyl)<sub>2</sub> groups, -C(=O)N(aryl)<sub>2</sub>  
67 groups, -C(=O)N(alkyl)(aryl) groups, -NH<sub>2</sub>, -NH(alkyl) groups,  
68 -NH(aryl) groups, -N(alkyl)<sub>2</sub> groups, -N(alkyl)(aryl) groups,  
69 -N(aryl)<sub>2</sub> groups, -C(=O)NH(heterocyclyl) groups,  
70 -C(=O)N(heterocyclyl)<sub>2</sub> groups, -C(=O)N(alkyl)(heterocyclyl)  
71 groups, and -C(=O)N(aryl)(heterocyclyl) groups;

72 R<sup>9</sup> and R<sup>18</sup> may be the same or different and are independently  
73 selected from the group consisting of substituted and  
74 unsubstituted alkyl groups, and substituted and unsubstituted  
75 aryl groups;

76 R<sup>10</sup> is selected from the group consisting of H, substituted and  
77 unsubstituted alkyl groups, substituted and unsubstituted aryl  
78 groups, and substituted and unsubstituted heterocyclyl groups;  
79 R<sup>11</sup> is selected from the group consisting of H, substituted and  
80 unsubstituted alkyl groups, substituted and unsubstituted aryl  
81 groups, substituted and unsubstituted heterocyclyl groups, -OH,  
82 alkoxy groups, aryloxy groups, -NH<sub>2</sub>, substituted and  
83 unsubstituted heterocyclylalkyl groups, substituted and  
84 unsubstituted aminoalkyl groups, substituted and unsubstituted  
85 alkylaminoalkyl groups, substituted and unsubstituted  
86 dialkylaminoalkyl groups, substituted and unsubstituted  
87 arylaminoalkyl groups, substituted and unsubstituted  
88 diarylaminoalkyl groups, substituted and unsubstituted  
89 (alkyl)(aryl)aminoalkyl groups, substituted and unsubstituted  
90 alkylamino groups, substituted and unsubstituted arylamino  
91 groups, substituted and unsubstituted dialkylamino groups,  
92 substituted and unsubstituted diarylamino groups, substituted  
93 and unsubstituted (alkyl)(aryl)amino groups, -C(=O)H, -C(=O)-  
94 alkyl groups, -C(=O)-aryl groups, -C(=O)O-alkyl groups,  
95 -C(=O)O-aryl groups, -C(=O)NH<sub>2</sub>, -C(=O)NH(alkyl) groups,  
96 -C(=O)NH(aryl) groups, -C(=O)N(alkyl)<sub>2</sub> groups, -C(=O)N(aryl)<sub>2</sub>  
97 groups, -C(=O)N(alkyl)(aryl) groups, -C(=O)-heterocyclyl groups,  
98 -C(=O)-O-heterocyclyl groups, -C(=O)NH(heterocyclyl) groups,  
99 -C(=O)-N(heterocyclyl)<sub>2</sub> groups, -C(=O)-N(alkyl)(heterocyclyl)  
100 groups, -C(=O)-N(aryl)(heterocyclyl) groups, substituted and  
101 unsubstituted heterocyclylaminoalkyl groups, substituted and  
102 unsubstituted diheterocyclylaminoalkyl groups, substituted and  
103 unsubstituted (alkyl)(heterocyclyl)aminoalkyl groups, substituted  
104 and unsubstituted (aryl)(heterocyclyl)aminoalkyl groups,  
105 substituted and unsubstituted hydroxyalkyl groups, substituted and  
106 unsubstituted alkoxyalkyl groups, substituted and

107           unsubstituted aryloxyalkyl groups, and substituted and  
108           unsubstituted heterocyclyoxyalkyl groups;

109           R<sup>12</sup> is selected from the group consisting of H, -OH, alkoxy  
110          groups, aryloxy groups, -NH<sub>2</sub>, -NH(alkyl) groups, -NH(aryl)  
111          groups, -N(alkyl)<sub>2</sub> groups, -N(aryl)<sub>2</sub> groups, -N(alkyl)(aryl)  
112          groups, substituted and unsubstituted alkyl groups, substituted  
113          and unsubstituted aryl groups, -NH(heterocyclyl) groups,  
114          -N(heterocyclyl)<sub>2</sub> groups, -N(alkyl)(heterocyclyl) groups, and  
115          -N(aryl)(heterocyclyl) groups;

116           R<sup>14</sup> is selected from the group consisting of substituted and  
117          unsubstituted alkyl groups, substituted and unsubstituted aryl  
118          groups, substituted and unsubstituted heterocyclyl groups,  
119          substituted and unsubstituted heterocyclylalkyl groups, -C(=O)H,  
120          -C(=O)-alkyl groups, -C(=O)-aryl groups, -C(=O)-heterocyclyl  
121          groups, -C(=O)NH<sub>2</sub>, -C(=O)NH(alkyl) groups, -C(=O)NH(aryl)  
122          groups, -C(=O)N(alkyl)<sub>2</sub> groups, -C(=O)N(aryl)<sub>2</sub> groups,  
123          -C(=O)N(alkyl)(aryl) groups, -C(=O)NH-heterocyclyl groups,  
124          -C(=O)N-(heterocyclyl)<sub>2</sub> groups, -C(=O)N(alkyl)(heterocyclyl)  
125          groups, -C(=O)N(aryl)(heterocyclyl) groups, substituted and  
126          unsubstituted aminoalkyl groups, substituted and unsubstituted  
127          alkylaminoalkyl groups, substituted and unsubstituted  
128          dialkylaminoalkyl groups, substituted and unsubstituted  
129          arylaminoalkyl groups, substituted and unsubstituted  
130          diarylarninoalkyl groups, substituted and unsubstituted  
131          (alkyl)(aryl)aminoalkyl groups, substituted and unsubstituted  
132          heterocyclylaminoalkyl groups, substituted and unsubstituted  
133          diheterocyclylaminoalkyl groups, substituted and unsubstituted  
134          (heterocyclyl)(alkyl)aminoalkyl groups, substituted and  
135          unsubstituted (heterocyclyl)(aryl)aminoalkyl groups, substituted and  
136          unsubstituted alkoxyalkyl groups, substituted and

137 unsubstituted aryloxyalkyl groups, substituted and unsubstituted  
138 hydroxyalkyl groups, and substituted and unsubstituted  
139 heterocyclyloxyalkyl groups;  
140 R<sup>15</sup> is selected from the group consisting of H, substituted and  
141 unsubstituted alkyl groups, substituted and unsubstituted aryl  
142 groups, and substituted and unsubstituted heterocyclyl groups;  
143 R<sup>16</sup> is selected from the group consisting of H, substituted and  
144 unsubstituted alkyl groups, substituted and unsubstituted aryl  
145 groups, substituted and unsubstituted heterocyclyl groups,  
146 -C(=O)H, -C(=O)-alkyl groups, -C(=O)-aryl groups, -C(=O)NH<sub>2</sub>,  
147 -C(=O)NH(alkyl) groups, -C(=O)NH(aryl) groups,  
148 -C(=O)N(alkyl)<sub>2</sub> groups, -C(=O)N(aryl)<sub>2</sub> groups,  
149 -C(=O)N(alkyl)(aryl) groups, -C(=O)O-alkyl groups, -C(=O)O-aryl  
150 groups, substituted and unsubstituted aminoalkyl groups,  
151 substituted and unsubstituted alkylaminoalkyl groups,  
152 substituted and unsubstituted dialkylaminoalkyl groups,  
153 substituted and unsubstituted arylaminoalkyl groups, substituted  
154 and unsubstituted diarylaminoalkyl groups, substituted and  
155 unsubstituted (alkyl)(aryl)aminoalkyl groups, substituted and  
156 unsubstituted heterocyclalkyl groups, -C(=O)-heterocyclyl  
157 groups, -C(=O)-O-heterocyclyl groups, -C(=O)NH(heterocyclyl)  
158 groups, -C(=O)-N(heterocyclyl)<sub>2</sub> groups, -C(=O)-  
159 N(alkyl)(heterocyclyl) groups, -C(=O)-N(aryl)(heterocyclyl)  
160 groups, substituted and unsubstituted heterocyclaminoalkyl  
161 groups, substituted and unsubstituted diheterocyclaminoalkyl  
162 groups, substituted and unsubstituted  
163 (heterocyclyl)(alkyl)aminoalkyl groups, substituted and  
164 unsubstituted (heterocyclyl)(aryl)aminoalkyl groups, substituted  
165 and unsubstituted hydroxyalkyl groups, substituted and  
166 unsubstituted alkoxyalkyl groups, substituted and unsubstituted

167                   aryloxyalkyl groups, and substituted and unsubstituted  
168                   heterocyclyoxyalkyl groups; and  
  
169                   R<sup>17</sup>, R<sup>19</sup>, and R<sup>20</sup> may be the same or different and are  
170                   independently selected from the group consisting of H, -NH<sub>2</sub>,  
171                   -NH(alkyl) groups, -NH(aryl) groups, -N(alkyl)<sub>2</sub> groups, -N(aryl)<sub>2</sub>  
172                   groups, -N(alkyl)(aryl) groups, -NH(heterocyclyl) groups,  
173                   -N(heterocyclyl)(alkyl) groups, -N(heterocyclyl)(aryl) groups,  
174                   -N(heterocyclyl)<sub>2</sub> groups, substituted and unsubstituted alkyl  
175                   groups, substituted and unsubstituted aryl groups, -OH,  
176                   substituted and unsubstituted alkoxy groups, substituted and  
177                   unsubstituted heterocyclyl groups, substituted and unsubstituted  
178                   aryloxy groups, heterocyclyoxy groups, -NHOH, -N(alkyl)OH  
179                   groups, -N(aryl)OH groups, -N(alkyl)O-alkyl groups, -N(aryl)O-  
180                   alkyl groups, -N(alkyl)O-aryl groups, and -N(aryl)O-aryl groups.

1                   2.         The compound according to claim 1, wherein Y is  
2         selected from the group consisting of -OH, -OR<sup>8</sup> groups, and -NR<sup>10</sup>R<sup>11</sup>  
3         groups.

1                   3.         The compound according to claim 1, wherein Y is a  
2         -NR<sup>10</sup>R<sup>11</sup> group.

1                   4.         The compound according to claim 1, wherein Z is an  
2         NR<sup>13</sup> group.

1                   5.         The compound according to claim 1, wherein R<sup>4</sup> and R<sup>7</sup> are  
2         hydrogen and R<sup>5</sup> and R<sup>6</sup> are selected from the group consisting of hydrogen  
3         and alkyl groups having from 1 to 4 carbon atoms.

1                   6.         The compound according to claim 1, wherein R<sup>5</sup> or R<sup>6</sup> is  
2         an -OR<sup>14</sup> group and R<sup>14</sup> is an alkyl, aryl, heterocyclyl, or heterocyclalkyl  
3         group.

1                   7.     The compound according to claim 1, wherein R<sup>5</sup> or R<sup>6</sup> is  
2     a -OCH<sub>2</sub>(CH<sub>2</sub>)<sub>q</sub>(heterocyclyl) group and q is 0, 1, 2, 3, or 4.

1                   8.     The compound according to claim 1, wherein R<sup>17</sup> is  
2     selected from the group consisting of substituted and unsubstituted alkyl  
3     groups, substituted and unsubstituted aryl groups, -NH<sub>2</sub>, -NH(alkyl) groups,  
4     -N(alkyl)<sub>2</sub> groups, -NH(aryl) groups, -N(aryl)<sub>2</sub> groups, -N(alkyl)(aryl) groups,  
5     -NH(heterocyclyl) groups, -N(heterocyclyl)(alkyl) groups, -N(heterocyclyl)(aryl)  
6     groups, -N(heterocyclyl)<sub>2</sub> groups, and N-containing heterocycles, wherein the  
7     N-containing heterocycles are bonded to the carbonyl carbon of the -C(=O)-  
8     R<sup>17</sup> group through either a nitrogen atom or a carbon atom in the rings of the  
9     N-containing heterocycles.

1                   9.     The compound according to claim 1, wherein one of R<sup>10</sup>  
2     or R<sup>11</sup> is H.

1                   10.    The compound according to claim 1, wherein R<sup>10</sup> and R<sup>11</sup>  
2     are both H.

1                   11.    The compound according to claim 10, wherein R<sup>1</sup> and R<sup>2</sup>  
2     join to form a substituted or unsubstituted 6 membered ring comprising at  
3     least one N atom.

1                   12.    The compound according to claim 11, wherein at least  
2     one of R<sup>5</sup> or R<sup>6</sup> is a substituted or unsubstituted heterocyclyl group.

1                   13.    The compound according to claim 11, wherein at least  
2     one of R<sup>5</sup> or R<sup>6</sup> is a substituted or unsubstituted heterocyclyl group selected  
3     from the group consisting of morpholine, piperazine, piperidine, 1,2,3-triazole,  
4     1,2,4-triazole, tetrazole, pyrrolidine, pyrazole, pyrrole, thiomorpholine,  
5     homopiperazine, benzimidazole, oxazolidin-2-one, pyrrolidin-2-one, imidazole,  
6     isoxazole, oxazole, isothiazole, thiazole, thiophene, furan, pyran,  
7     tetrahydrothiophene, tetrahydrofuran, tetrahydropyran, and pyridine.

1               14.     The compound according to claim 1, wherein R<sup>1</sup> and R<sup>2</sup>  
2 join to form a substituted or unsubstituted 6 membered ring comprising at  
3 least one N atom.

1               15.     The compound according to claim 1, wherein at least one  
2 of R<sup>5</sup> or R<sup>6</sup> is a substituted or unsubstituted heterocycl group.

1               16.     The compound according to claim 1, wherein at least one  
2 of R<sup>5</sup> or R<sup>6</sup> is a substituted or unsubstituted heterocycl group comprising at  
3 least one O or N atom.

1               17.     The compound according to claim 1, wherein at least one  
2 of R<sup>5</sup> or R<sup>6</sup> is a substituted or unsubstituted heterocycl group selected from  
3 the group consisting of morpholine, piperazine, piperidine, 1,2,3-triazole,  
4 1,2,4-triazole, tetrazole, pyrrolidine, pyrazole, pyrrole, thiomorpholine,  
5 homopiperazine, benzimidazole, oxazolidin-2-one, pyrrolidin-2-one, imidazole,  
6 isoxazole, oxazole, isothiazole, thiazole, thiophene, furan, pyran,  
7 tetrahydrothiophene, tetrahydrofuran, tetrahydropyran, and pyridine.

1               18.     The compound according to claim 1, wherein Y is  
2 selected from the group consisting of from -N(CH<sub>3</sub>)<sub>2</sub>, -NH(CH<sub>3</sub>), -NH(CH<sub>2</sub>CH<sub>3</sub>),  
3 -N(CH<sub>2</sub>CH<sub>3</sub>)<sub>2</sub>, -NH(aryl) groups, -N(aryl)<sub>2</sub> groups, -HNHNH<sub>2</sub>, -NHN(CH<sub>3</sub>)<sub>2</sub>,  
4 -N(CH<sub>3</sub>)NH(CH<sub>3</sub>), -NH(CH<sub>2</sub>)<sub>m</sub>NH<sub>2</sub> groups, -NH(CH<sub>2</sub>)<sub>m</sub>NH(alkyl) groups,  
5 -NH(CH<sub>2</sub>)<sub>m</sub>N(alkyl)<sub>2</sub> groups, -N(alkyl)(CH<sub>2</sub>)<sub>m</sub>NH<sub>2</sub> groups,  
6 -N(alkyl)(CH<sub>2</sub>)<sub>m</sub>NH(alkyl) groups, -N(alkyl)(CH<sub>2</sub>)<sub>m</sub>N(alkyl)<sub>2</sub> groups,  
7 -NH(CH<sub>2</sub>)<sub>n</sub>(heterocycl) groups, -N(alkyl)[(CH<sub>2</sub>)<sub>n</sub>(heterocycl)] groups,  
8 -NH(CH<sub>2</sub>)<sub>m</sub>OH groups, -NH(CH<sub>2</sub>)<sub>m</sub>OCH<sub>3</sub> groups, -NHCH<sub>2</sub>CH(NH<sub>2</sub>)CH(CH<sub>3</sub>)<sub>2</sub>,  
9 -NH(2-aminocyclohexyl), -NH(cyclohexyl), -NHOCH<sub>3</sub>, -NH(N-morpholinyl), and  
10 -NH(quinuclidyl), wherein m is 2, 3, or 4 and n is 0, 1, 2, or 3.

1               19.     A pharmaceutical formulation, comprising the compound  
2 according to claim 1 in combination with a pharmaceutically acceptable  
3 carrier.